REMARKS

This Submission, filed in reply to the Office Action dated July 19, 2006, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

The Examiner asserted, in item 2 of the Office Action, that "Natsuume discloses a polyolefin polymer material, which apparently is a cycloolefin polymer, and thus should have the same s-polarization properties as those recited in the instant claims". Applicant submits that the Examiner's rejection is based on an unsupported position of inherency.

It was already known at the time the present invention was made, among those skilled in the art, that the polarization properties of processed resin products are not primarily determined by the materials thereof. In this regard, Applicant attaches hereto References 1-8, which are technical literature. It is stated in Reference 1 (Editor-in-Chief, Fumio Ide, "Transparent Resin in the Optical Era", CMC Publishing Co., LW,, June 2004, p. 80: The publication data of Reference 1, and References 2, 4 and 5, which will be described later, is shown in Reference 7) that:

> *"Even if the structure of amorphous resin has birefringence properties (an intrinsic birefringence value),* ***birefringence is not observed as long as structural units of the resin are randomly arranged because they cancel each other. However, birefringence is observed as orientation birefringence induced by molecular orientation produced by molding or processing. Or, birefringence is observed as stress birefringence induced by residual stress or external stress produced by molding or processing."***

Meanwhile, the "polyolefin polymer material", specified by the Examiner, is amorphous resin. Therefore, "polyolefin polymer material" should have the features described in Reference 1. This does not include the polarization properties as claimed without a specific process to induce such polarization.

Further, in Reference 2 ("Transparent Resin in the Optical Era", p. 80, the same document as Reference 1), Figure 3 illustrates the feature that the birefringence of a flat-plate-shape sample made of a polyolefin polymer, which is formed by injection-molding, varies depending on the position of the sample with respect to a gate for injection-molding. Further, in Reference 2, the photograph of Figure 4 shows that at a portion of the sample close to the gate for injection-molding, the birefringence is apparently higher than that of the other portion of the sample, The photograph was obtained by arranging two polarizers in a cross-nicol state and by placing the sample therebetween. The transmittance of light increases by rotation of the polarization direction, at a portion of the sample at which birefringence has been induced. Consequently, this portion is observed as a white portion.

Further, Reference 3 shows a photograph of a dielectric block (the shape of the dielectric block is substantially the same as that of the measurement chip 510 illustrated in Figure 11 of the present application) made of a cycloolefin polymer, which was produced by the applicant of the present invention. The photograph was obtained while the two polarizers are arranged in the cross-nicol state. In the photograph, a portion at which birefringence has been induced is observed as a white portion. The photograph clearly shows that the birefringence level is not the same in the entire dielectric block, Specifically, in the photograph, a light-beam transmitting portion of the dielectric block is the portion below the bottom of a liquid holding portion (a sample holding portion), which is positioned approximately at the center of the dielectric block with respect to the vertical direction. In the photograph, the light-beam transmitting portion is black, and it is recognized that the birefringence level thereof is relatively low. In contrast, most of the other

parts of the dielectric block are white, and it is recognized that the birefringence level thereof is relatively high.

As these examples clearly show, if the shape of an object formed by injection-molding is complex, the object does not always possess the same polarization properties as those of a sample that is made of the same material as that of the object, which has a simple shape. Further, as clearly described in Reference 4 ("Transparent Resin in the Optical Era", p, 245, the same document as Reference 1) and Reference 5 ("Transparent Resin in the Optical Era", p. 246, the same document as Reference 1), it is recognized by those skilled in the art that as the shape of the object becomes more .complex, it becomes more difficult to maintain the polarization properties.

It is stated in Reference 4 that:

> *"It is needless to say that a die (a mold and a die head or nozzle), a molding machine and molding conditions must be appropriately selected to achieve high accuracy and low distortion, In addition, it is essential to prepare a die temperature control apparatus, a material drying apparatus for stabilizing material, a temperature bath, a material stably-supplying apparatus and the like and to set conditions for using them".*

Further, it is stated in References 4 and 5 that:

> *"In injection molding, which is most popularly adopted in production of plastic lenses, the main process (melting resin by heat, filling by plasticization and injection, and solidifying by cooling) occurs at a cylinder and in the interior of a die. Therefore, it is difficult to directly observe the main process from the exterior of the apparatus. Hence, the injection molding is sometimes called "a murder in a locked room." To solve such problems, simulations are performed and research is carried out to develop techniques for causing the cylinder and the interior of the die to become visible and to develop techniques for measuring the fluidization temperature of resin and pressure".*

As explained above in detail, the polarization properties of a processed resin product are **highly** affected by the shape thereof Especially, if the processed resin product is made of amorphous resin, the polarization properties of the processed resin product also depend on the molding/processing conditions. Therefore, even if the same resin material is used, the same polarization properties are not always obtained. Hence, even if the polyolefin polymer material. is used as the material for the resin block in the invention of Naya, the intensity of the s-polarization component at the interface between the b lock and a metal film will not be the same as the intensity obtained in the invention claimed in Claim 1 of the present application.

When the dielectric block is produced using a resin material, it is possible to set the polarization properties of the dielectric block as recited in Claim 1 by appropriately selecting a die, *a* molding machine or the like and by controlling molding conditions, the temperature of the die or the like, as described in Reference 4.

Further, in item 5 of the Office Action, the Examiner asserted that "[I]t would have been obvious to one of ordinary skill in the art to substitute the Zeonex cycloolefin polymer of Natsuume et al. for the high refractive index glass or polycarbonate material in the dielectric block of the surface plasmon optical modulator element of Naya because the transmittance properties of the Zeonex would provide for a more sensitive optical element." However, Applicant submits that the Examiner's position is not supportable.

Specifically, it was already known, at the time the present invention was made, that cycloolefin polymer, typified by ZEONEX, has low affinity for many kinds of organic or inorganic material, as described in Reference 6 (edited by TORAY Research Center, Inc., Research Section, "Transparent Resin and Its New Optical Applications", TORAY Research,

Inc., March 1997, p.75: The publication data of "Transparent Resin and Its New Optical Applications" is shown in Reference 8 in the appendix attached to this letter). As described in Reference 6, techniques for improving the affinity of cycloolefin have been developed. However, the affinity of cycloolefin is still lower than that of other kinds of conventional materials which are generally used for optical cells.

Those skilled in the art may have easily conceived of forming a simple transparent optical cell that has a container shape using cycloolefin, which has the aforementioned properties. However, they would not have easily conceived of forming a dielectric block of a surface plasmon resonance measurement chip using the cycloolefin. Specifically, in this kind of measurement chip, a metal film is fixed onto the dielectric block included therein. Further, in some cases, an antigen, an antibody or the like is fixed onto the dielectric block in addition to the metal film. Therefore, it is necessary to form a linker layer on the surface of the dielectric block, and when the linker layer is formed on the surface of the dielectric block, it is desirable for the affinity of the surface of the dielectric block for the linker layer to be high Hence, those skilled in the art would not have selected cycloolefin, of which the affinity is low, as the material for the dielectric block. Consequently, cycloolefin polymer and cycloolefin copolymer were neither used nor proposed as the material for a prism member for SPR (surface plasmon resonance) prior to the date the present invention was made.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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23373
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Date: March 19, 2007